

\*\*\*\*\*  
DEPARTMENT OF THE NAVY  
NAVAL FACILITIES  
ENGINEERING COMMAND  
GUIDE SPECIFICATION  
\*\*\*\*\*

NFGS-DB-01782  
31 March 1998

## SECTION TABLE OF CONTENTS

### DIVISION 01 - GENERAL REQUIREMENTS

#### SECTION 01782

#### OMSI MANUAL FOR DESIGN BUILD

03/98

#### PART 1 GENERAL

##### 1.1 SUMMARY

- 1.1.1 Section Includes
- 1.1.2 Related Sections

##### 1.2 SUBMITTALS DURING CONSTRUCTION

- 1.2.1 SD-19 Operation and Maintenance Manuals
  - 1.2.1.1 Draft OMSI Manual
  - 1.2.1.2 Complete OMSI Manual

#### PART 2 PRODUCTS

##### 2.1 OMSI MANUAL COMPOSITION

###### 2.1.1 General Requirements

- 2.1.1.1 Manual Description
- 2.1.1.2 Organization
- 2.1.1.3 Sources of Data
- 2.1.1.4 Metric Manuals

###### 2.1.2 Format

- 2.1.2.1 Binders
- 2.1.2.2 Pages, Dividers and Tabs
- 2.1.2.3 Oversize Sheets
- 2.1.2.4 Preface
- 2.1.2.5 Table of Contents

###### 2.1.3 OMSI Part I - Facility Information

- 2.1.3.1 General Facility and Systems Descriptions
- 2.1.3.2 Basis of Design
- 2.1.3.3 Safety Hazards
- 2.1.3.4 Floor Plans
- 2.1.3.5 Site Plans and Utility Connection and Cutoff Plans
- 2.1.3.6 Extended Warranty Information
- 2.1.3.7 Equipment Inventory
- 2.1.3.8 HVAC Filters
- 2.1.3.9 Floor Coverings
- 2.1.3.10 Wall Surfaces
- 2.1.3.11 Ceiling Surfaces
- 2.1.3.12 Windows
- 2.1.3.13 Lighting Fixtures
- 2.1.3.14 Bathroom and Plumbing Fixtures

- 2.1.3.15 Roofing
- 2.1.3.16 Supply Inventory Requirements
- 2.1.3.17 As-built Drawing List
- 2.1.3.18 Training Requirements
- 2.1.3.19 Skill Matrix
- 2.1.4 OMSI Part II - Primary Systems Information
  - 2.1.4.1 Operation
  - 2.1.4.2 Preventive Maintenance
  - 2.1.4.3 Repair
  - 2.1.4.4 Manufacturer's Data
- 2.1.5 OMSI Part III - Product Data
  - 2.1.5.1 Record of Material and Equipment
  - 2.1.5.2 Written Warranties
- 2.2 O&M PROCEDURES VALIDATION
  - 2.2.1 Presentation
  - 2.2.2 Verification
  - 2.2.3 Corrections and Changes to the OMSI Manuals

## PART 3 EXECUTION

-- End of Section Table of Contents --

```

*****
DEPARTMENT OF THE NAVY                                NFGS-DB-01782
NAVAL FACILITIES                                       31 March 1998
ENGINEERING COMMAND
GUIDE SPECIFICATION
*****

```

NFGS-DB-01782

OMSI MANUAL FOR DESIGN BUILD

```

*****
*                                                                 *
* Preparing Activity: NORTHNAVFACENGCOM                        *
*                                                                 *
*          Typed Name & Reg.          Signature          Date          *
*                                                                 *
* Prepared by: F. D'Armi, Jr.          _____          _____ *
*                                                                 *
* Approved by: J. Campbell, R. A.      _____          _____ *
*               Branch Manager                                     *
*                                                                 *
* Approved by: J. T. Duffy, R.A.       _____          _____ *
*               Division Director                                 *
*                                                                 *
* Approved for NAVFAC: _____          _____          *
*                   Carl E. Kersten, R.A.                       *
*                                                                 *
*****
AMSC N/A                                              AREA FACR

```

\*\*\*\*\*  
DEPARTMENT OF THE NAVY  
NAVAL FACILITIES  
ENGINEERING COMMAND  
GUIDE SPECIFICATION  
\*\*\*\*\*

NFGS-DB-01782  
31 March 1998

SECTION 01782

OMSI MANUAL FOR DESIGN BUILD  
03/98

\*\*\*\*\*

NOTE: THIS DESIGN BUILD SPECIFICATION IS PUBLISHED  
AS A BETA TEST.

THE DESIGN BUILD GUIDE SPECIFICATIONS HAVE BEEN  
REVISED TO REFLECT COORDINATION COMMENTS AND NUMBER  
AND TITLE CHANGES MADE TO THE STANDARD PRESCRIPTIVE  
NAVFAC GUIDE SPECIFICATIONS PER CSI MASTERFORMAT  
1995 EDITION. HOWEVER, MIL-HDBK-1006/5, "GUIDANCE  
AND PROCEDURES FOR THE NEWPORT DESIGN BUILD PROCESS"  
(THE COMPANION DOCUMENT) HAS NOT BEEN REVISED TO BE  
COORDINATED WITH THE CHANGES MADE IN THE GUIDE  
SPECIFICATIONS BUT MAY STILL BE USED IN THE  
PREPARATION OF A DESIGN BUILD PROJECT.

FOR INFORMATION OR QUESTIONS CONCERNING THIS  
SECTION, CONTACT MR. JOHN FIDLER AT NORTHERN  
DIVISION, NAVAL FACILITIES ENGINEERING COMMAND,  
TELEPHONE (610) 595-0578.

\*\*\*\*\*

\*\*\*\*\*

NOTE: This guide specification covers requirements  
for preparation and submission of an Operation and  
Maintenance Support Information (OMSI) Manual  
required in a construction contract utilizing the  
Newport Design Build methodology of procurement.  
Use this guide specification in conjunction with  
other Newport Design Build guide specifications as  
well as standard prescriptive NAVFAC guide  
specifications to develop the IFB specification.  
Refer to the current edition of MIL-HDBK-1006/5,  
"Guidance and Procedures for The Newport Design  
Build Process", for instructions in the use of this  
and other Newport Design Build guide specifications.

Include all paragraphs contained in this guide  
specification for all projects except as directed  
otherwise by a criteria note. Do not edit the  
paragraphs except to fill in the blanks where  
specific project information is required or to make  
choices where brackets occur.

\*\*\*\*\*

\*\*\*\*\*

NOTE: In a conventional construction project, the Architectural/Engineering (A/E) Firm or in-house team designing the facility and preparing the construction plans and specifications will also assemble and prepare the OMSI Manual. In a Newport Design Build construction project, the construction Contractor's design team is tasked with developing the OMSI Manual.

This guide specification was written to produce a very basic OMSI Manual which is considered appropriate for the types of facilities to be constructed utilizing the Newport Design Build process (e.g., simple, small scale, one story facilities). However, the IFB preparer shall identify and assess the OMSI requirements for the facility to be constructed and shall determine the adequacy of the OMSI Manual which will be developed using this guide specification. OMSI Manual content should be tailored to the complexity of the particular facility and its systems.

See criteria note accompanying paragraph titled "OMSI Part II - Primary Systems Information" for additional guidance.

\*\*\*\*\*

## PART 1 GENERAL

### 1.1 SUMMARY

#### 1.1.1 Section Includes

This section includes requirements for developing an Operation and Maintenance Support Information (OMSI) Manual for the facility being constructed. The purpose of the OMSI Manual is to provide operating and maintenance personnel factual, concise and comprehensive as-built information that describes the efficient, economical and safe operation, maintenance, and repair of the facility.

#### 1.1.2 Related Sections

Submission and content requirements for Product Data and Operation and Maintenance (O&M) Data Packages are specified in Section 01332, "Submittals During Construction for Design Build" and Section 01781, "Operation and Maintenance Data".

### 1.2 SUBMITTALS DURING CONSTRUCTION

\*\*\*\*\*

NOTE: The "G" in asterisk tokens following a submittal item indicates Government approval and should be retained. This Newport Design Build guide specification has been prepared to indicate those

submittal items requiring Government approval. Do not add or delete such tokens unless the submittal item itself is deleted. Submittal items not designated with a "G" will be approved by the QC organization.

\*\*\*\*\*

Submit the following for review and approval by the Government as specified herein.

#### 1.2.1 SD-19 Operation and Maintenance Manuals

- a. Draft OMSI Manual G
- b. Complete OMSI Manual G

##### 1.2.1.1 Draft OMSI Manual

Submit [3] [\_\_\_\_\_] copies of the draft OMSI Manual [90] [\_\_\_\_\_] calendar days prior to contract completion date.

The purpose of this submittal is to present the plan being followed for preparation of the OMSI Manual. Include binders, cover insert sheets, spine inserts sheets, preface, tables of contents, dividers, and other materials as necessary to demonstrate the proposed physical arrangement of the OMSI manuals and the quality of the copies, dividers and tabs. Submit the following as a minimum:

- a. OMSI Part I, Facility Information. Provide all available information for Part I, Facility Information.
- b. OMSI Part II, Primary Systems Information. Identify all systems that will be addressed in Part II, Primary Systems Information. Provide at least one system essentially complete. Select one system of moderate complexity and develop the various operational and maintenance aspects of the system. This development should have sufficient depth to clearly demonstrate the arrangement and level of detail proposed for all systems that will be included.
- c. OMSI Part III, Product Data. Provide at least [one] [two] Division[s] of Part III, Product Data, essentially complete.

##### 1.2.1.2 Complete OMSI Manual

Submit [3] [\_\_\_\_\_] copies of the complete OMSI Manual [30] [\_\_\_\_\_] calendar days prior to contract completion date.

## PART 2 PRODUCTS

### 2.1 OMSI MANUAL COMPOSITION

#### 2.1.1 General Requirements

The Contractor's design team shall develop the OMSI Manual.

##### 2.1.1.1 Manual Description

The OMSI Manual shall contain detailed as-built information that describes the efficient, economical and safe operation, maintenance, and repair of

the facility. The OMSI Manual shall be factual, concise, comprehensive and written to be easily used by operating and maintenance personnel. Descriptive material and theory shall include technical details that are essential for a comprehensive understanding of the operation, maintenance and repair of the actual products, equipment and systems built into the facility. Ensure that changes to products, equipment and systems made during construction are reflected in the Manual.

#### 2.1.1.2 Organization

Prepare the OMSI Manual in three Parts: Part I - Facility Information, Part II - Primary Systems Information, and Part III - Product Data. Cross referencing within or between OMSI manuals shall be specific. Requirements for each Part are specified below.

#### 2.1.1.3 Sources of Data

Approved construction submittals such as O&M Data, Product Data and Shop Drawings required by the technical sections of the project specification developed by the Contractor, shall be the primary sources of information used to develop the OMSI Manual. Include only relevant information from the construction submittals by excluding transmittal sheets, QC certification pages, etc. Assemble and supplement the data with original information to produce an OMSI Manual that describes the efficient, economical and safe operation, maintenance and repair of the facility.

#### [2.1.1.4 Metric Manuals

\*\*\*\*\*  
**NOTE: Include this paragraph when appropriate for  
the project, otherwise delete.**  
\*\*\*\*\*

Projects designed with metric units of measurement require metric OMSI manuals. Show all measurements and units in metric OMSI manuals in SI (System International) metric units exclusively.

#### ]2.1.2 Format

##### 2.1.2.1 Binders

\*\*\*\*\*  
**NOTE: In the blank space below, identify the  
EFD/EFA administering the contract.**  
\*\*\*\*\*

Bind the OMSI manuals in durable, hard cover, water and grease resistant binders, which hold 8 1/2 by 11 inch A4 (297 by 210 mm) sheets. Binders shall have clear pockets located on the front and on the spine that hold printed sheets. Identify each binder on both the cover insert sheet and the spine insert sheet with the following information:

- a. OMSI Manual Part I, II or III with appropriate titles
- b. Building Number
- c. Project Title

- d. Project Number
- e. Activity and Location
- f. Construction Contract Number
- g. Prepared For: [\_\_\_\_\_]
- h. Prepared By
- i. Volume Number

Each binder is a single volume. Number each volume consecutively. For example, an OMSI Manual composed of 5 binders would have the Part I - Facility Information binder labeled Volume 1 of 5 and the last Part III - Product Data binder would be Volume 5 of 5.

- a. Part I - Facility Information Binder: Bind in a white, post type, loose leaf binder of appropriate size.
- b. Part II - Primary Systems Information Binders: Bind in blue, post type, loose leaf binders with 3 inch 75 mm capacity. More than one system may be included in a single binder provided that all sections of each system are included in that binder.
- c. Part III - Product Data Binders: Bind in red, post type, loose leaf binders with 3 inch 75 mm capacity.

#### 2.1.2.2 Pages, Dividers and Tabs

Use high quality paper and dividers made of heavy duty paper with plastic reinforced holes and integrated tabs.

- a. Part I - Facility Information Divider: Use white tabs to identify the major items.
- b. Part II - Primary Systems Information Dividers: Use blue tabs with bold type to identify the system titles. Use dividers with white tabs to identify the different sections under each system and the major topics under each section.
- c. Part III - Product Data Dividers: Use white tabs to show the Division 2 through 16 number and title. Use dividers with colored tabs to identify the specification section number with keywords to identify the section title. Use colored non-tab dividers to separate large equipment groupings such as valves, pumps, chillers and to separate the O&M data within each specification section.

#### 2.1.2.3 Oversize Sheets

Insert oversized sheets into the binders as single fold-out sheets. Oversized sheets are defined as submittals, instruction sheets, drawings, etc., larger than 8 1/2 by 11 inches A4 (297 by 210 mm), but not exceeding 11 by 17 inches 275 by 425 mm. Oversized sheets shall be folded to expose the sheet's title block. Submittals or drawings exceeding 11 by 17 inches 275 by 425 mm, which cannot be reduced, shall be inserted in labeled, clear plastic pockets.

#### 2.1.2.4 Preface



\*\*\*\*\*

NOTE: Identify the EFD/EFA administering the  
contract and insert their address and appropriate  
code and phone numbers.

\*\*\*\*\*

Insert a Preface as the first page in each volume. The Preface shall read  
as indicated below. No tab sheet is required with the Preface page.

```

*****
*
*                                     PREFACE
*
*
* INTRODUCTION
*
* Operation and Maintenance Support Information (OMSI) was prepared for
* this project to help you operate, maintain, and repair the facility
* over its life cycle.  OMSI manuals provide a comprehensive, organized
* library of as-built materials, equipment and systems.  Use the OMSI
* manuals as the first step in solving your operation, maintenance or
* repair problems.  Your comments or suggestions are welcome and should
* be forwarded to:
*
*      [Commander] [Commanding Officer] [[_____] Division] [Engineering
*      Field Activity [_____]
*      Naval Facilities Engineering Command
*      [_____]
*      Attn: Code [_____] .  Telephone [_____] , FAX [_____] .
*
* CONTENTS
*
* OMSI Part I - Facility Information:  This portion of the OMSI manuals
* contains Basic User Information needed on a daily basis by the owner or
* tenant of the facility.  Examples:  General Facility and System
* Descriptions, Utility Connection and Cut-off Plans, Safety Hazards,
* Warranty Information.  Part I, Facility Information also provides the
* information you need to quickly prepare Maintenance Service Contracts
* and Performance Work Statements for O&M and Custodial Service
* Contracts.  Examples of this information:  area totals for floor
* coverings, wall and ceiling surfaces; number, types, and sizes of
* lighting fixtures, bathroom fixtures, windows and HVAC filters.
*
* OMSI Part II - Primary Systems Information:  This portion of the OMSI
* manuals provides detailed operation, preventive maintenance, repair,
* and manufacturer's data for each system selected.  This information
* includes items such as normal and emergency operating procedures, flow
* diagrams, PM requirements, spare parts, troubleshooting, repair
* procedures, and warranty provisions.  You can expect better PM, faster
* repairs, and reduced down time by using information in this part of the
* OMSI manuals.
*
* OMSI Part III - Product Data:  This portion of the OMSI manuals
* consists of construction contractor submittals for as-built materials
* and equipment such as manufacturer's catalog data, shop drawings, test
* data, and Operation and Maintenance Data not included in Part II.
* Part III is organized by the Divisions and Sections of the construction
* specifications.  For example, if you wanted to find information about
* sprinkler system alarm valves, you would look under Division 13
* "Special Construction", and then in Section 13930, "Wet-Pipe Fire
* Suppression Sprinklers".  This allows you to quickly identify the exact
* product installed, part number, manufacturer, etc.  Part III also
* includes architectural product information for items such as ceiling
* tile, carpeting, plumbing, and lighting fixtures.  This information
* will keep your facility looking sharp for many years through
* product-specific maintenance and replacement of its architectural
* features.
*

```

```

* UPDATING *
* *
* The OMSI manuals must reflect the facility's existing components; *
* therefore, you must continually update the manuals. When equipment or *
* components are replaced, add pertinent new information to each manual *
* set. Be sure to update all sections of the OMSI manuals that reference *
* the replaced item. Purge all information on the replaced item to *
* prevent confusion. *
*****

```

#### 2.1.2.5 Table of Contents

Provide a Master Table of Contents for the entire set of OMSI manuals. Place a Master Table of Contents after the Preface page in each volume. Provide a specific Table of Contents for Part I, Facility Information, for each system in Part II, Primary Systems Information; and for each Division and Section in Part III, Product Data.

#### 2.1.3 OMSI Part I - Facility Information

##### 2.1.3.1 General Facility and Systems Descriptions

Describe the function of the facility. Detail the overall dimensions of the facility, number of floors, foundation type, expected number of occupants, and facility category code. List and generally describe all the facility systems addressed in Part II, Primary Systems Information and any special building features (such as cranes, elevators, and generators). Include photographs, marked up and labeled to show key operating components and the overall facility appearance.

##### 2.1.3.2 Basis of Design

Include the Basis of Design in narrative form that shows the basic design scope of work, assumptions and intentions of the design.

##### 2.1.3.3 Safety Hazards

List all residual hazards identified in the "Requirements Hazard Analysis". Provide recommended safeguards for each identified hazard.

##### 2.1.3.4 Floor Plans

Provide uncluttered, legible 11 by 17 inch 275 by 425 mm floor plans. Exact copies of the design drawings are not acceptable. Include room numbers, type or function of spaces, and overall facility dimensions on the floor plans. Do not include construction instructions, references, frame numbers, etc.

##### 2.1.3.5 Site Plans and Utility Connection and Cutoff Plans

Provide uncluttered, legible 11 by 17 inch 275 by 425 mm site and floor plans. On the utility site plans and floor plans indicate the main interior and exterior connection and cutoff points for all utilities. Include sufficient information to enable someone unfamiliar with the facility to locate the connection and cutoff points. Indicate the room number, panel number, circuit breaker, valve number, etc., for each connection and cutoff point, and what that connection or cutoff point controls. Do not include items such as contour lines, elevations, and subsurface information on the site plans. These plans shall be in addition

to the "Floor Plans" required above.

#### 2.1.3.6 Extended Warranty Information

List all warranties for products, equipment, components, and subcomponents whose duration exceeds one year. Cross reference the list to the warranty copies included in Part II, Primary Systems Information or in Part III, Product Data. For each warranty listed indicate the applicable specification section, duration, start date, end date, and the point of contact for warranty fulfillment. Also, list or reference all specific operation and maintenance procedures that must be performed to keep the warranty valid.

#### 2.1.3.7 Equipment Inventory

Provide an equipment inventory that includes item descriptions, locations, model numbers; and the names, addresses, and telephone numbers of the manufacturers, suppliers, contractors, and subcontractors. Limit the equipment inventory to major components such as shown on the design drawings equipment schedules.

#### 2.1.3.8 HVAC Filters

Provide a table that lists the quantity, type, size, and location of each HVAC filter.

#### 2.1.3.9 Floor Coverings

Provide a table that lists by room number (including corridors and common spaces), the type of space, type of floor covering and area of floor. The table shall include a facility summary of the total area for each type of space and floor covering.

#### 2.1.3.10 Wall Surfaces

Provide a table that lists by room number (including corridors and common spaces), the type of wall surface, and area of wall surface. The table shall include a facility summary of the total area for each type of wall surface.

#### 2.1.3.11 Ceiling Surfaces

Provide a table that lists by room number (including corridors and common spaces), the type of ceiling surface, and area of ceiling surface. The table shall include a facility summary of the total area for each type of ceiling surface.

#### 2.1.3.12 Windows

Provide a table that lists by room number (including corridors and common spaces), the type of window, window size, number of each size and type, and special features. The table shall include a facility summary of the total number for each type and size of window.

#### 2.1.3.13 Lighting Fixtures

Provide a table that lists by room number (including corridors and common spaces), the type of lighting fixture, number of lighting fixtures, type of bulbs or tubes, and number of bulbs and tubes. The table shall include a

facility summary of the total number of fixtures of each type and number of bulbs or tubes of each type.

#### 2.1.3.14 Bathroom and Plumbing Fixtures

Provide a table that lists by room number, the number and type of plumbing and bathroom plumbing fixtures (e.g., sinks, water closets, urinals, showers and drinking fountains).

#### 2.1.3.15 Roofing

Provide the total area of each type of roof surface and system. Provide the name of the roofing product and system; manufacturer's, supplier's, and installer's names, addresses, and phone numbers. For each type of roof, provide a recommended inspection, maintenance and repair schedule that details checkpoints, frequencies, and prohibited practices. List roof structural load limits.

#### 2.1.3.16 Supply Inventory Requirements

Provide a list of maintenance and repair supplies (e.g., spare parts, fuels, lubricants, etc.) required to ensure continued operation without unreasonable delays. Identify and list parts and supplies that have long lead purchase time. Give special consideration to facilities at remote locations.

#### 2.1.3.17 As-built Drawing List

Provide a list of the as-built drawings. Include NAVFAC drawing number and title. Identify where the drawings and project specifications will be filed.

#### 2.1.3.18 Training Requirements

Provide a list of recommended training related to the operation, maintenance and repair of each installed system that is available from the manufacturer or other source. Provide the name, address, and phone number of point of contact. The training requirements shall pertain only to systems addressed in Part II, Primary Systems Information.

#### 2.1.3.19 Skill Matrix

Provide a matrix by system and skill that identifies productive hours required to maintain the facility's systems addressed in Part II, Primary Systems Information. An example of the format follows.

	Hours			
	System 1	System 2	System 3	Total/Skill
Skill 1				
Skill 2				
Skill 3				
Skill 4				
Total/System				

#### 2.1.4 OMSI Part II - Primary Systems Information

\*\*\*\*\*

**NOTE: The following are typical systems to be**

addressed in Part II - Primary Systems Information for buildings constructed using the Newport Design Build process. However, buildings containing complex HVAC systems may need to have subsystems addressed separately. Systems required for the building but not listed in the text below should be added so as to be addressed in Part II. Systems which may also need to be addressed in Part II include:

- a. Intercommunication System
- b. Intrusion Detection Systems
- c. Steam/Hot Water Boiler Systems
- d. Direct Digital Control System (DDC)
- e. Computer Monitoring and Control System (CMCS)

The above list is not complete, but represents additional or alternate systems which may be required in typical buildings constructed using the Newport Design Build process.

\*\*\*\*\*

Prepare the information required for Part II, Primary Systems Information using a systems approach. This approach requires that consideration be given to the entire system (that is, the interfaces of equipment, connections and material flow within the system). Include the following systems:

- a. HVAC System
- b. Space Temperature Controls System
- c. Fire Alarm System
- d. Fire Suppression System(s)
- e. [\_\_\_\_\_]

Use Notes, Cautions and Warnings throughout Part II, Primary Systems Information to emphasize important and critical instructions and procedures. Place Notes, Cautions and Warnings immediately before the applicable instructions or procedures. Notes, Cautions and Warnings are defined as follows:

Note: Highlights an essential operating or maintenance procedure, condition or statement.

Caution: Highlights an operating or maintenance procedure, practice, or condition, statement, etc., that, if not strictly observed, could result in damage to or destruction of equipment, loss of mission effectiveness, or health hazards to personnel.

Warning: Highlights an operating or maintenance procedure, practice, condition, or statement, etc., that, if not strictly observed, could result in injury to or death of personnel.

#### 2.1.4.1 Operation

- a. System Description: Provide a detailed discussion of the system composition and operation. Include technical details that are essential for an understanding of the system.
- b. Start-Up and Shutdown Procedures: Provide step by step instructions to bring systems from static to operational configurations and from operating to shutdown status.
- c. Normal Operating Instructions: Provide a discussion of the normal operation and control of the system. Address operating norms (e.g., temperatures, pressures, and flow rates) expected at each zone or phase of the system. Supplement the discussion with control and wiring diagrams and data.
- d. Emergency Operating Instructions: Provide emergency operating procedures in the event of equipment malfunctions. Provide shutdown instructions for fires, explosions, spills, or other contingencies.
- e. System Flow Diagrams: Provide a flow diagram indicating system liquid, air (do not include ductwork) or gas flow during normal operations. Integrate all system components into the diagram. A compilation of non-integrated, flow diagrams for the individual system components are not acceptable.
- f. Diagrammatic Plans: Provide floor plans indicating the location of equipment and configuration of the system installation. Include the configuration of associated piping or wiring. Subordinate structural features to utility features.
- g. Environmental Considerations: Provide a listing of the equipment that requires special operation, reporting, testing, analysis or inspection to comply with federal, state or local environmental laws. Examples of possible list items include back flow preventer inspections, underground storage tank testing, hazardous material or waste usage and storage documentation, and air pollution control devices. Each item in the list shall include requirements for environmental operation, reporting, testing, analysis and inspection as well as references to respective implementing regulations, statutes, or policies.
- h. Operator Servicing Requirements: Provide instructions for services to be performed by the operator such as lubrication, adjustments, and inspection.
- i. Safety Instructions: Provide a list of all personnel hazards and equipment safety precautions including recommended safeguards.
- j. Valve List: Provide a list of all valves associated with the system. Show valve type, identification number, function, location and normal operating position.
- k. Operating Log: Provide forms, samples, and instructions for keeping necessary operating records.

#### 2.1.4.2 Preventive Maintenance

- a. Preventive Maintenance Plan and Schedule: Provide a Preventive

Maintenance (PM) plan using manufacturer's recommendations and sound engineering practice. Include all major pieces of equipment. Provide a check sheet that details maintenance tasks and associated frequencies. Also provide an annual schedule indicating when maintenance tasks should be performed such that work is spread as evenly as possible throughout the year.

- b. Preventive Maintenance Procedures: Provide a Task Card for each individual maintenance task identified on the PM Plan and Schedule. Include detailed PM procedures, safety instructions and precautions including Lock Out/Tag Out precautions, required skill level, number of personnel needed, frequency, special tools needed, parts needed, and estimated time required to complete the task.
- c. Lubrication Schedule: Provide a lubrication schedule indicating types, grades, and capacities of lubricants for specific temperature ranges and applications.
- d. Preventive Maintenance Log: Provide a tabular form for recording the accomplishment of PM. Log shall record date PM was performed, findings, action taken, parts used, time required to complete the work, and other data necessary to provide a good historical record of PM activities.

#### 2.1.4.3 Repair

- a. Troubleshooting Guides and Diagnostic Techniques: Provide step by step procedures for isolating the cause of system malfunctions. The procedures shall clearly state indications or symptoms of trouble; the sequential instructions, including checks and tests to be performed and conditions to be sought, to determine the cause; and remedial measures to bring the equipment and system to operating condition. Identify special test equipment required to perform the procedures. Start the troubleshooting guide at the system level and proceed to a level where detailed manufacturer's troubleshooting procedures for equipment and components can be referenced.
- b. Repair Procedures: Provide repair instructions required to restore equipment to proper operating standards. References shall be specific as to location within the OMSI manuals.
- c. Removal and Replacement Instructions: Provide or refer to the manufacturer's data for the instructions on the removal and replacement of equipment components. References shall be specific as to location within the OMSI manuals.

#### 2.1.4.4 Manufacturer's Data

- a. Operation and Maintenance Data: Include the O&M Data Package information (SD-19 submittals) required for the equipment and systems specified in the technical sections of the project specification developed by the Contractor. Incorporate this information into each system discussion under the Operation, Preventive Maintenance and Repair sections of Part II, Primary Systems Information.
- b. Manufacturer's Equipment Information: Provide drawings,



illustrations and technical data furnished by the manufacturer for the equipment and system components. Organize and index the information for easy reference.

#### 2.1.5 OMSI Part III - Product Data

##### 2.1.5.1 Record of Material and Equipment

\*\*\*\*\*  
**NOTE: Include bracketed text when appropriate for  
the project, otherwise delete.**  
\*\*\*\*\*

Provide a record of materials and equipment used in the facility construction. Include Product Data required in Divisions 2 through 16 of the project specification. Examples of Product Data include manufacturer's catalog data, instructions, test reports and warranties. Include shop drawings relevant to the operation and maintenance of the facility or system except those used in Part II, Primary Systems Information. Do not include extraneous data (e.g., transmittal sheets, certifications, welder qualifications, contractor qualifications and certificates of compliance).

Highlight or note submittals that contain information for several parts or model numbers to identify installed material. [Product data included in Part III, Product Data shall use metric units if metric OMSI manuals are required. Conversion to metric units is not required for product data that contains only English units.]

##### 2.1.5.2 Written Warranties

Provide copies of extended equipment warranties.

#### 2.2 O&M PROCEDURES VALIDATION

The operation and maintenance procedures shall be validated at the site in the presence of designated Government representatives. The validation process shall be scheduled and completed at a time mutually agreeable to the Contractor (system installation contractor), designated Government personnel (including operating personnel), and the Contracting Officer. Provide the services of personnel, that have detailed technical and organizational knowledge of the OMSI manuals, to perform the validation of the OMSI manuals. The purpose of the validation is to present the OMSI manuals to the users and to verify the OMSI manuals' completeness and accuracy.

##### 2.2.1 Presentation

Present the OMSI manuals to designated Government representatives at the activity site. The presentation shall show how the OMSI manuals are organized, what they contain, how they are referenced and cross referenced, and how to use them in day-to-day operation, maintenance and repair.

##### 2.2.2 Verification

Field verify the accuracy and completeness of the OMSI manuals. This includes verifying that the systems and equipment in the OMSI manuals accurately reflect the as-built conditions; verifying that O&M procedures are appropriate for the systems and equipment that they support; and verifying that equipment nomenclature and system configurations are accurate.

### 2.2.3 Corrections and Changes to the OMSI Manuals

Make corrections and changes to the manuals recommended as a result of the validation process prior to final acceptance of the manuals. After the validation process, make corrections and changes to the manuals resulting from in service use of the facility at no additional cost to the Government under the warranty clause of the contract.

### PART 3 EXECUTION

Not used.

\*\*\*\*\*

NOTE: Suggestions for improvement of this  
specification will be welcomed using the Navy  
"Change Request Forms" subdirectory located in  
SPECSINTACT in Jobs or Masters under  
"Forms/Documents" directory or DD Form 1426.  
Suggestions should be forwarded to:

Officer In Charge  
Seabee Logistics Center  
NAVFAC 15G/SLC 15E  
4111 San Pedro Street  
Port Hueneme, CA 93043-4410

\*\*\*\*\*

-- End of Section --